



Arsenic Water Technology Partnership Program

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Arsenic Water Technology Partnership Program

- \$7M Funded by Congress through DOE
- Additional \$1,250,000 from AwwaRF
- Partnership Administration- Partnership Management Committee (PMC)



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Program Objectives

- Using a peer-reviewed, cost-shared research program, develop and demonstrate innovative technologies for removal and disposal of arsenic from drinking water
- Cost/Decision Tool for technology selection
- Tech transfer & community outreach



Objectives (Cont.)

- Focus on small systems-
40% of resources directed to rural and Native American utility needs
- Reduce energy consumption
- Minimize costs- capital, operating, maintenance
- Minimize residual quantities & disposal costs



Program Components

- Bench-Scale Studies (AwwaRF)
- Pilot-scale studies (Sandia)
- Economic Analysis (WERC)
- Technology Transfer (WERC)



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Awwa
Research
Foundation

Awwa Research Foundation & Arsenic Bench-Scale Studies

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AwwaRF's History of Arsenic Research

- 31 projects starting in 1993
- \$7 million (\$10 million value)
- Arsenic Research Partnership with EPA and ACWA



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Objectives of Bench-Scale Partnership Studies

- Reduce cost, minimize operational requirements & residuals, reduce energy consumption
- Investigative Approach
 - new/innovative technologies
 - modifications to existing treatment
 - other (monitoring or management technologies)



Bench-Scale Process

- Identify specific and/or general topics
- Open and competitive process
 - Solicit proposals
 - 25% in-kind contractor match
 - Review and selection by peers



Expert Workshop 8/2003

- Research Needs Identified
 - Arsenic residuals
 - Non-treatment alternatives
 - In Situ treatment
 - Development of new removal media



■ Research Needs Identified

- Innovative/combined treatment processes
- Reduce competitive ion effects
- Impacts of intermittent operation
- Utility evaluation test protocol

■ 8 Projects Funded Under RFP 3013

- Developing a New Class of Ion Exchangers for Selective Removal of Arsenic
- Agglomerated Nanoparticle Media
- Comparison of Arsenic Removal by Coagulation—Filtration with Zirconium and Titanium Salts in Comparison with Ferric Salts
- Aerogel & Iron-Oxide Impregnated GAC



- As Removal onto Activated Carbon Preloaded w/ Surfactant-Iron Complexes
- Subsurface Treatment for As Removal
- Technologies Linked to Residuals Stabilization
- High Efficiency & Cost-Effective Zirconium & Titanium-Based Nanocomposites for Removal of Arsenic from D.W.

■ RFPs in Development

Arsenic Treatment Solutions for Very Small Systems

Objective- Develop new technologies, applications, design and approaches that will allow very small utilities (i.e. 25-250 connections) and regulated drinking water systems such as Non-community, non-transient systems to comply with the arsenic MCL.



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■ RFPs in Development

Secondary Impacts of Arsenic Removal Treatment

Objective- Determine the water quality impacts from ion exchange and aluminum-based arsenic treatment technologies on distribution system water due to contact with iron-, copper-, lead- and arsenic-containing materials/deposits in the distribution system.



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■ RFPs in Development

Arsenic Treatment Technologies

Objective- Development of new and modified technologies that will help utilities comply with the arsenic MCL. Of particular interest are approaches that could significantly lower costs of current treatment approaches in terms of energy, capital costs and residuals disposal.



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■ RFPs in Development

Arsenic Removal Technologies- Phase II

Objective- Continue bench-scale research of Phase I projects funded under RFP 3013 for those projects deemed most promising.



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■ RFPs in Development

Surface Complexation Modeling of Arsenic Removal Media

Objective- Development of a computer model that will assist in predicting media performance under different water quality conditions.

- ~\$400,000 of additional bench-scale research needs will be identified and funded with current appropriations.
- Sandia National Labs will conduct \$3M in pilot-scale studies focusing on technologies that are not yet commercially available or in unique water qualities.
- WERC will advance cost/decision tool and develop outreach, tech transfer materials



WERC's University Design Contest

Develop and demonstrate a cost-effective, energy-efficient treatment technology to remove arsenic and nitrate from drinking water in the presence of other competing ions such as silica and phosphate for rural communities



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WERC www.werc.net/contest/

SANDIA
www.sandia.gov/water/arsenic.htm

EPA
www.epa.gov/ord/nrmrl/arsenic/
– Arsenic Rule Implementation Research



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<http://www.awwarf.org/research/TopicsAndProjects/topicSnapShot.aspx?Topic=Arsenic>

- ❖ 37 Projects
- ❖ Web-based arsenic cost tool available to subscribers



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Arsenic Water Technology Partnership Program Thank you

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